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IMPACT OF COMPUTER TECHNOLOGY ON SECRETARIAL AND CLERICAL FUNCTIONS AT RESEARCH DIVISION

Report No 89-272-K

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ABSTRACT

This report describes the impact of computer technology on the secretarial and clerical functions at Research Division. It presents findings in areas such as productivity, job satisfaction, product and service quality, relief and job security. Critical management issues are described and guidelines are offered as to how they should be managed. These issues include training, support, career development, and organizational structure and job ratings. The professionals' use of computer technology is also dealt with as it impacts on the secretarial and clerical support functions.

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EXECUTIVE SUMMARY

The impact to-date of computing technology on the secretarial and clerical functions at Research Division has had both positive and negative effects. Some of the positive impacts include:

a) *time savings*, used to generate benefits from increased productivity;
b) *increased product and/or service quality* and faster turnaround time, from sophisticated technological capabilities;
c) *increased job satisfaction*, as staff feel increased pride and self-confidence from mastering the technology, and enjoy using it; and
d) *increased development opportunities*, when freed-up time is used for more challenging work requiring initiative and self-reliance.

Negative impacts include:

a) *misuse or wasting of time*, where more or better products or services are provided than are required;
b) *reliability concerns*, when technology doesn't work as expected and contingency provisions are required in the event of failure;
c) *more difficult relief management*, as the variety of technology increases;
d) *job security concerns*, when technology is used by staff other than the secretaries or clerks to perform support functions; and
e) *decreased job satisfaction*, from poor introduction of technology and potential for isolation from sources of information and personal contacts.

There are a number of management issues that emerged from the investigation of the impact of computing technology. They are categorized as follows:

a) *training/education*, where there is a lack of basic knowledge of the technology fundamentals, poorly timed training, and/or not enough time provided on-the-job;

b) *support*, where staff mostly rely on professional staff, Operations Research staff, and peers with varying degrees of success with regard to availability, capability and comfort level;

c) *career paths*, where new and potentially higher-rated administrative and technical positions may be available to staff if they have a supportive supervisor and opportunities to learn and use computing technology in their work environment;

d) *organizational structure and job ratings*, where local support requirements are changing because of the introduction of computing technology; and

e) *professionals' usage*, where technology has to some extent "blurred" the functional lines between secretarial/clerical staff and the professional staff they have traditionally supported, by providing support capabilities to all staff.

These issues need to be dealt with in order to effectively manage the impact of computing technology. Guidelines are offered in the following areas:

a) *hiring* - Learning skills, flexibility, initiative and adaptability to change are increasingly important.

b) *introduction of technology* - The manner of technology implementation is critical. Staff should be involved and assured of employment continuity.

c) *training/education* - Training services should be integrated and appropriate training should be identified and provided, both on-the-job and outside normal working hours. Standard technology should be adopted for support functions.

d) *support* - Local dedicated staff should be available to provide support, particularly for local specialized technology usage. Other staff should develop and/or support standard technology for common support applications.

e) *productivity* - Common sense and good judgement are required to evaluate the efficient and effective application of technology, and to ensure that product quality and/or service is appropriate.

f) *job satisfaction* - Jobs need to be designed in keeping with the capabilities of both the staff and the technology. Ergonomic factors related to physical and/or mental stresses should be addressed in accordance with corporate policies and guidance.

g) *career development* - There are more opportunities for staff development and new challenging positions available as a result of implementing computing technology. Supervisors need time to assess development needs of support staff and assistance in managing the impact of technology on support functions.

h) *organizational structure and job ratings* - A change in the current reporting relationships of section secretaries is suggested, together with the inclusion of more administrative functions to support the "management team" concept.

i) *professionals' usage* - Guidelines should be developed so that support functions are performed by the appropriate staff. The number of secretarial and clerical staff and the technology resources provided to them should be assessed so that the best use is made of all staff resources.

In summary, there is a direct benefit to the productivity of all Research Division staff in having a technologically-capable, trained and motivated support staff. Personal initiative of supervisors, secretarial and clerical staff, availability of the computing technology and work opportunities are all key factors. It is hoped that a greater awareness and understanding of the impact to-date of computing technology on the secretarial and clerical functions will improve future management decisions.

ACKNOWLEDGEMENTS

I was provided with a great deal of information from staff within Research Division, elsewhere in Ontario Hydro, and external organizations. About 60 people participated in the interview process, including the Research Division Director and Managers. They are all identified in the appendices to this report and I thank them for their contribution.

In particular, Mr. J. Bruce Brown and Dr. Mikk Anyas-Weiss were most helpful in guiding the overall direction of this project.

Alda McMahon

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1. INTRODUCTION

1.1 Study Purpose and Method

The purpose of this report is to communicate to the Research Executive the results of an investigation of the impact of computer technology on the secretarial and clerical functions at Research Division. Managers are concerned that the impact is not being managed as well as it could be, and are aware that the implementation of the Integrated Computing Environment (I.C.E.) will affect how work will be done and support requirements.

Discussions were conducted initially with managers and supervisors of secretarial and clerical staff in other parts of the Corporation to assist in defining the scope of the project. Appendix 1 identifies those who participated. Interviews were then held with individuals at the Research Division: the Director, Department Managers and their secretaries, and a sampling of section secretaries and clerical staff and their supervisors. Staff providing technical support to the secretaries and clerks were also interviewed. Divisional staff are identified in Appendices 2 and 3.

1.2 Current Environment

All of the secretarial staff at Research Division use microcomputers and have them at their desks. The most common application is word processing; some staff use the technology for nothing else. Others use applications in areas such as mail logging, performance contracts, vacation scheduling, budgeting, and project tracking. However, most of the secretaries use such technology for less than half a day during a typical day. A few individuals' jobs have changed significantly in that they are administering and/or maintaining local systems or networks.

Application of technology to secretarial functions has been driven to some extent by the manager's or section head's own use of technology or, conversely, reluctance to use technology. This reluctance, combined with circumstances requiring that information be obtained or processed electronically, has therefore created the demand for a computer-literate secretary.

The use of computing technology is not as universal among the clerical staff. Only about half of them use microcomputers or terminals, which may not necessarily be located at their desks. They do little word processing; most clerical work is in data input and retrieval from local or corporate (mainframe) databases.

Currently, technology appears to be more widely applied to secretarial functions than to clerical functions. A number of explanations have been offered. Some argue that it's not cost-effective to apply expensive technology to functions employing inexpensive labour. A clerical function is usually only part of a multi-stage process and significant payback seems possible only if the entire process is computerized.

Clerical staff themselves believe that their jobs are perceived to be of lower status and profile than others in the Division, and that this is why they are not automated as quickly. Others point to local resourcing strategies, which favour the acquisition or upgrading of technology for professional staff first. Any old equipment they may have had previously might only then be passed over to local support (clerical and secretarial) staff. Therefore, as described elsewhere in this report, other problems arise because of the older technology.

Almost all of the secretarial and clerical staff interviewed say they are aware of specific technology that would provide even more benefits than they currently realize, but that they lack the knowledge and time required to install and apply it, e.g. mail logging, calendaring, etc. They know they aren't making the fullest use possible of the technology they do have and, to some degree, feel guilty and frustrated about it.

1.3 Report Layout

Positive and negative impacts from the use of technology to-date are described in the following two sections. These impacts derive not only from direct use by the support (secretarial and clerical) staff, but also indirectly from use by the managerial, supervisory and professional (engineering and scientific) staff. The most significant applications to-date have been in the areas of sophisticated word processing and desktop publishing, computerized databases, and automated data collection.

The fourth and fifth sections of this report describe the impact of technology as it relates to key issues and provide some guidelines as to how they should be managed. These include training, support, staff development, and organizational structure and job ratings. The professionals' usage of computer technology is also dealt with, as it impacts on the secretarial and clerical support functions.

2. POSITIVE IMPACTS

2.1 Time savings

Technology is a catalyst in the sense that, via many of its applications to secretarial and clerical functions, time is saved and is therefore available for other work. For example:

- the function may now be performed entirely by the technology (e.g. voice messaging system);
- staff can perform the function faster using the technology (e.g. accounting);
- staff other than secretaries and clerks are using the technology to perform some part of the function (e.g. professionals creating documents using word processing);
- re-input or conversion functions are eliminated or drastically cut-back because products in electronic form are easily processed (e.g. data in databases, word processing documents).

At this point, not very much of the first type of application has been experienced at Research Division. However, installation of the planned voice messaging system is expected shortly and could have a significant effect on the support staff role in voice communications. As the I.C.E. messaging and document transfer facilities become commonly available, similar impacts are expected.

Benefits from increased productivity from other applications vary with the management decision as to how that freed-up time should best be used. One significant factor in this decision is the lack of professional and supervisory resources to do work, because of hiring constraints and/or flatter organizational structures. Support staff are in some cases being used to the degree possible to fill the gap, particularly where technology can substitute for knowledge or skill otherwise lacking.

Technology in some areas allows more sophisticated functions to be performed with less knowledge from the staff operating it e.g. expert systems. This therefore improves the productivity of professionals if they can pass all or part of the function over to support staff. As the professional saves time in this and in their own use of technology, they are able to take on more work projects and thereby increase their support requirements.

In other cases, additional work can be done which may not necessarily require the use of technology. For example, non-routine and labour-intensive activities in the personnel function or in managing clients may not have been done to the desired extent because of lack of staff resources and other priorities. Such work (e.g. providing advice on pensions options, keeping clients regularly informed of work status) could now be done by support staff who have more time. However, while many would find such work quite interesting, they may also experience stress not previously encountered in the traditional secretarial or clerical job, which the supervisor should be aware of.

Managers indicate that there has been a steadily increasing administrative workload at Research Division because of corporate and legislative requirements. Support requirements of professionals have also increased, due in part to increased productivity from using technology. However the number of support staff has not gone up significantly. The workload demand is being met by increased productivity due in large part to the use of technology, by support staff as well as by professional staff. For example, it is quite common now for first drafts of products to be provided to secretaries in electronic form, restoring time formerly lost to difficulties with illegible handwriting, mathematical and scientific notations, etc.

2.2 Increased product and/or service quality

Product and/or service quality can often be dramatically improved by the application of technology in a variety of ways. For example, more attempts are made to improve product quality with the knowledge that changes can be quickly and easily made. There is now, in fact, an expectation of higher quality than before because of the capability provided by technologies such as graphics and desktop publishing to improve readability.

Fast turnaround time also contributes to increased quality of product or service, since errors can be more quickly identified and corrected. A large part of the clerical function in particular consists of information services. Technology assists in requiring less time to respond to requests, particularly ad hoc queries which may previously have been difficult to answer if information was not easily accessible. This then benefits the client in various ways, depending on the circumstances.

Technology may even replace skill requirements to a certain extent and improve product quality where the skill level wasn't high enough e.g. spelling-checking software. Support staff indicate that there is more accuracy, for example, now that automated data collection has replaced manual keying of large quantities of numbers.

2.3 Increased job satisfaction

Many support staff note that being able to master the technology and produce quality products or services leads to increased pride, self-confidence, self-esteem and an overall sense of accomplishment. Technology is also seen in a very positive light when it contributes to improved quality, because of the pride they have in their work. Increased productivity also raises morale as staff are able to successfully meet the challenge of an increased workload, or to respond more quickly to ad hoc queries.

Some technologies allow the user to be more creative, and thereby increase job interest and satisfaction. High job satisfaction also results if technology makes performance of the function more enjoyable or leads to more varied and interesting work or is seen to make the person more competitive for higher-rated jobs. In particular, if saved time is put towards higher-valued functions then staff say they enjoy the associated higher status conferred on their position.

Support staff also note that technology is seen very positively when it allows them to assist other divisional staff or clients who might otherwise have "bothered" their manager or supervisor. They see their role as keeping such interruptions to a minimum and appreciate the assistance of technology in facilitating this.

Many of the secretarial staff say they appreciate technology in particular when it allows them to perform functions at their desk that they previously had to be absent to do e.g. message or document delivery. They feel they are providing better support service by being available in this way.

2.4 Increased development opportunities

Now that technology is being used to increase the efficiency of the process, support staff are being evaluated on the quality of the product or service. One section head describes the change in their function as "using heads more than hands". Support staff often need to make decisions on new options made available by technology. New skills, creativity, and initiative are required to meet these new responsibilities. As technology frees up time there are opportunities for staff to develop in new areas and broaden their experience.

Section heads say that they now judge support staff on how well they adapt to technology and exercise initiative. They give staff interesting and challenging assignments on this basis of judging advancement potential; previously the quantity and quality of work produced were key factors. Staff development is therefore greatly influenced by their initiative in seeking out and applying new technology, and by opportunities provided in their working environment and/or by their supervisor.

For example, professional staff apply technology to their own functions and then, once it is operating smoothly (and the novelty of using the technology has worn off), they pass the function to support staff. The productivity of professional staff increases in this situation, in addition to the support staff development. It is suggested that even more development could occur via this process, but that many professionals are enamoured of the technology or do not have the time to instruct support staff on its use.

While time savings allow higher-rated functions to be introduced into the job, continuing job functions still include time-consuming, largely manual lower-rated activities such as mail, photocopying, phone-answering, filing, etc. Therefore the time available for new activities is often restricted by these elementary duties. In fact, as technology allows staff to demonstrate their initiative and capabilities, staff and supervisors alike question the need for some traditional, time-consuming, manual support duties. Arrangements are being made in some cases to off-load such duties to lower-rated support staff or to eliminate them altogether.

Staff often need to be self-reliant to resolve problems in using the technology since their supervisor is usually not knowledgeable in its use. This may involve interpreting computer manuals, or seeking assistance from vendors, or other computer-literate staff nearby or in other units. As staff become more knowledgeable they are perceived as local experts and others turn to them for training and assistance. This develops new skills in teaching and problem analysis.

Peer competition is a factor for many of those who take the initiative to learn and use new technology. It is perceived that support staff performing functions with technology enjoy higher status and have more time for development opportunities. (In fact, some staff say they even resent it when their peers are provided the technology and opportunities to pursue it; they say that benefits are quickly realized, including personal growth and skills allowing their peers to compete more successfully for better jobs.)

3. NEGATIVE IMPACTS

3.1 Misuse or wasting of time

Time savings from using the technology may be wasted in providing better products or services than are required. For example, many support and supervisory staff brought up the common case of 50 drafts of a document being done instead of five, with dubious incremental benefit. As this attitude of providing the best possible using the

technology becomes prevalent, higher quality standards are created implicitly. Without control, more time is spent than just what may have been saved.

Numerous staff note that professionals and support staff alike are more careless with drafts, proofreading, information requests, etc. because they know that changes are easier with technology. To some extent this decreases productivity since more errors are part of the initial product or service and/or are repeatedly identified for correction.

There is also a temptation to make full use of the technology by applying it indiscriminately to functions. Support staff are conscious of not using the technology for many of their activities. When they are concerned that their supervisor thinks that it is being underutilized, they may spend unnecessary time transforming activities to use the technology without any real benefits (e.g. keeping a list updated). Some time is also spent in accommodating differences in computer technologies, by way of conversion or re-input activities, when the problem might have been avoided with some planning.

3.2 Reliability concerns

With the variety of hardware and software in Research Division that is often "hot off the press" with accompanying problems, support staff become very frustrated and confused when something doesn't work as it's supposed to. Some fear that they themselves have "broken" the equipment or programs inadvertently. They are reluctant to take exploratory action in fixing the problem. They are often frustrated and confused, since they are accustomed to having a "right" way to do something that always works.

When the technology doesn't work as expected or "the system is down", contingency plans become extremely important. Productivity suffers when the technology is unavailable since workload demands are so much higher than before this dependency existed. For example, backup provisions for electronic media are now essential whereas previously this activity was not required or as difficult to perform. One clerk indicated that the manual system is still maintained because they are not confident of the backup capability provided by the technology.

3.3 More difficult relief management

Many managers and supervisors believe there is a growing problem in getting relief staff, particularly for short periods of time, with knowledge and skills in their local technology. They attribute this to the lack of technology standardization, even in common support functions such as word processing.

Relief in a more technical support job becomes a problem unless other staff have been trained as backup and can retain the technical skills and knowledge required. Even so, training of relief staff takes longer than it did and they must meet the higher standards of performance now set by the staff's use of technology. While these situations can be good training opportunities for relief staff, using temporary employees is therefore not as cost-effective as it used to be because of the training investment.

Knowledgeable technicians are being used in some areas to relieve support staff. Often, however, clerical or secretarial relief staff are asked to perform only the manual functions such as mail distribution and phone answering. Any work requiring use of technology, particularly if it is unfamiliar, simply waits until the regular staff person is back (who must then catch up on the backlog). One clerk notes that the manual system is run in parallel with the computerized one and the relief does the manual work only.

3.4 Job security concerns

There is no doubt that use of technology by the professionals in particular is having an effect on the support staff's workload. Information in electronic form can be obtained, processed and produced with minimal secretarial or clerical assistance (e.g. using word processing packages, accessing computerized databases). Staff are therefore concerned about the security of their jobs when there is a visible increase in freed-up time without a corresponding increase in workload. Some functions (e.g. meeting scheduling) can be done solely by the technology. Staff question not only the introduction of such technology, but also the appropriateness of professional staff doing other support functions using the technology e.g. keying timesheet data directly into a database, producing final documents, etc.. This often leads to job challenges.

3.5 Decreased job satisfaction

There are a number of other negative impacts which are difficult to categorize except as to how they decrease job satisfaction. They are therefore described here in a somewhat chronological order as they relate to the introduction of the technology.

Particularly for support functions, the technology is often imposed by the supervisor or others. There is rarely prior consultation with or involvement of the support staff in the investigation of which technology would be most suitable. Reaction to this from staff varies according to their individual capabilities and perceptions as to how well they can learn the new technology. Some are not able to cope very well when the job and skill requirements change. There is also widespread unhappiness with the quality of training and support, which is described more fully in section 4 of this report.

This situation was not as dramatic before the advent of computer technology. By and large, support staff researched and requested improvements to tools they used in the performance of their functions. Now, however, professionals get the technology for themselves and either bring it in also for their support staff or give them their own obsolete equipment to improve services. Some support staff express resentment that technology does not appear to be similarly "forced" on professionals. Others are unhappy that professionals seem to easily obtain better equipment that might be used only rarely.

Some secretarial staff say that they had no say in the selection of even the word processing software for use in the section. They feel their own intimate knowledge of the function was not valued and that previous responsibility for tool support has been taken away. Traditionally support staff have been evaluated and rewarded on their competence with their tools, and on their self-reliance. They now feel that the non-

technology becomes prevalent, higher quality standards are created implicitly. Without control, more time is spent than just what may have been saved.

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participative introduction of technology shows up their ignorance and makes it much more difficult for them to solve their own problems.

There is often resistance from staff experienced with manual systems. They have "perfected" such systems and would like tangible evidence of the benefits of technology, particularly considering the initial increase in effort required to introduce it and make it work. Unfortunately, particularly in the clerical area, the implementation may require staff to key in literally years-worth of information before the system is operational. This is seen as tedious and frustrating, particularly since any benefits aren't seen for some time. Negative reactions to the technology are then reinforced.

Staff find that they are asked to make multiple changes to products, precisely because people know it is easily done because of the technology. However, they often find doing numerous incremental changes boring, particularly when they believe that the impact on the product quality is negligible (e.g. changing the position of page numbers on a report). Conversion activities required because of incompatible technologies are also seen to be tedious and time-consuming.

Support staff sometimes feel isolated from the people and business they support as they and others use technology. The requirement for personal contact can be reduced as communications technology replaces face-to-face or voice interactions (e.g. electronic mail and messaging, voice mail). Since social interaction is an important part of building good working relationships, some support staff say they deliberately choose not to use network messaging.

As professionals make more use of technology, there is a tendancy to bypass the support staff, e.g. by doing their own document creation, electronic messaging, information retrieval, etc. While overall productivity appears to improve, support staff are now less able to respond to queries concerning unit activities or to manage the information flows appropriately.

For example, instead of keying in documents from scratch, support staff may only be requested to format or to proofread for spelling and grammar. Such work is perceived to be boring if it forms a significant part of the day's activity, but is tolerated if only minimal. While the typing workload is reduced, staff say that they previously had time to read the documents, and enjoyed acquiring knowledge about the unit's operations in this way. Producing final copies or making minor editorial or formatting changes doesn't allow the same extent of learning.

Therefore, pride of the support staff in their contribution to the product or service is affected. The less knowledgeable they feel, the less ability they have to contribute to and take "ownership" of the product or service. Support staff also feel that others hold them responsible for poor quality products, assuming that they rather than the professionals produced them as was previously the norm. They are unhappy about this situation because they see their own reputation being adversely and unfairly affected.

Lastly there are some physiological impacts, particularly when video-based computer equipment such as personal computers are used for long periods of time without break. Muscle and eye strains are occasionally experienced as well as headaches. There are some concerns as well about the potential for radiation from VDT's and its effect on pregnancies, eye cataracts, etc. However, because prolonged and intensive use of the technology is said to be infrequent by support staff, occurences of these symptoms seem to be relatively few.

4. MANAGEMENT ISSUES

4.1 Training/education

4.1.1 Problems

Elementary problems related to hardware operation or the DOS environment are common and frustrating, because support staff lack a basic overview and knowledge of computer operation. Because menus are commonly used there is a perception that less skill and knowledge is required to run the application. However, unforeseen problems occur regularly and staff are usually unable to cope, much to their frustration and confusion. The Computing Services Unit (CSU) support staff in Operations Research Department say that they receive many requests to solve relatively simple DOS-related problems.

Staff say they are often sent on a course without having the ability or opportunity immediately afterwards to apply what they've learned about the technology. Whatever is learned is therefore quickly forgotten. Staff say that "just in time" training is most effective, particularly if they are given a work application with a flexible deadline.

Training is not felt to be adequate when provided by staff not totally familiar with the applications used by the staff and the hardware and software supporting them. Support staff are confused and frustrated when it is clear that the trainer is learning at the same time, as is often the case. Ad hoc, "try it and see" ways of learning are foreign to support staff who are accustomed to practising skills (e.g. typing) and learning functions by rote or drill.

Staff sometimes feel under pressure to be more productive immediately to justify the investment in the technology, particularly since workload has been heavy recently because of staffing contraints. Work deadlines normally do not take into account or underestimate learning time. Support staff attribute this in part to the supervisor or professional who is a technology afficionado and spends much personal time learning. Work request deadlines therefore often conflict with the need for time for on- and off-the-job training and leads to frustration and poor performance. Therefore, even though encouraged to use technology to perform a function, staff frequently do it in the traditional manual way to meet a deadline.

Supervisors and professionals see that some support staff are very reluctant to change from one technology to another, particularly if the benefits of doing so aren't clear and/or there isn't enough demand to force its usage. This reluctance is attributed to the significant investment staff have in learning the original technology and problems with regard to training and support. Lack of common technology standards, both in Research Division and within Ontario Hydro, is often cited as a barrier to managing training, and by support staff as being very frustrating as they try to be, as one secretary put it, "Jack of all trades, master of none".

Training problems have been further complicated by previous restrictions on the availability of budget monies for computing equipment. A philosophy of "better have more poor computers than only a few good ones" fostered a proliferation of such technology. The reluctance to waste even these resources meant that those not used for equipment monitoring were passed on to support staff, often without helpful manuals or training, and with obsolete software (e.g. VISICALC). In fact, often the software would be an illegal copy without any manuals at all to rely on. While the situation is now much improved, the problems associated with this earlier process created difficult learning experiences for support staff.

4.1.2 Learning Requirements

Keyboarding skills, awareness of computer principles and familiarity with basic computer operations are key requirements. Particularly in the scientific setting, mathematical knowledge is also an asset to deal with software packages catering to documents requiring special notation.

Because technology is not static, retraining is often required because of frequent changes in technology (hardware and software). Many supervisors note that all staff need to be continually learning just to keep up with changes, let alone to become competent with the technology. Training is also required when the support person moves to another unit, even though the job functions may be the same, because of different technology used in that unit. For staff unused to demands for continual learning, this is often frustrating. Their supervisors are sympathetic and say that technology is changing faster than our ability to organize and use its capabilities in a meaningful and productive way. Its introduction means that staff continually have new problems to deal with, many of which can't be anticipated and prepared for via training.

Periodic retraining on even the same technology is felt to be necessary. Except for elementary word processing, most staff say they don't make frequent enough use of it to keep up their knowledge and skill levels. Many of their functions, although using technology, are not performed regularly and time is frequently required to become familiar again with its use.

4.1.3 Time Requirements

Some supervisors indicate that not enough money is budgetted for formal training of all staff; it is generally allocated more for professional staff rather than for support staff. Heavy support workload and deadlines are cited as reasons for the reluctance of

some supervisors to provide training time to support staff, since relief provisions are seen to be inadequate (described in section 3.3). However, others indicate that they encourage support staff to take courses, and are often disappointed when staff don't "leap" at such opportunities.

Some staff on the other hand say they do appreciate such opportunities. However, many of them do not feel they can take the time offered for training because of their workload. Some of them regularly work lunches and overtime to meet deadlines. They say that if they are away for training, even with relief, most of the work piles up waiting for their return and they have to work harder than ever to catch up. They express concern about relief doing their functions not as well, and therefore inconveniencing clients or affecting the unit's performance in other ways. A few staff indicate that their workload is manageable and that they do in fact take time at work or at courses during work time to learn, but they are in the minority. Most say that learning invariably requires personal time. Some staff respond by taking portable computers home unless they already have a computer at home on which they can practise; others say that Hydro should provide paid time during working hours and will not use personal time to train.

Support staff note that when professionals get the technology, they treat the learning effort as another research experience i.e. "it's our business to experiment". They can usually take time to learn on-the-job, without impacting on sometimes self-imposed and flexible work deadlines, unlike the support work environment. Thus, support staff are often jealous of the time they see is available to others to learn, when they themselves have heavy and immediate workload and productivity expectations set out for them.

Even when time is available on-the-job to learn or to use the technology, support staff find it difficult because of the constant interruptions which are part of their normal work environment, i.e. phone calls or visits requesting or providing information, etc. Most staff find this very disruptive and difficult to recapture the point they were at. Staff fortunate enough to have answering machines often turn them on when trying to work with the technology at their desks, to minimize interruptions. However, most staff say that they feel they must be available to respond to work requests at all times.

4.1.4 Impact of External Education

Newly-hired staff are seen to have an "edge" in progressing to more highly-rated technical jobs, since the educational system now provides computer skills and principles to students at an early age. Such skills are rapidly becoming a job requirement, as opposed to simply being desirable. For example, a recent vacancy notice for a Schedule 04 trainee states "In an increasingly sophisticated computer environment, both PC and mainframe skills are definite assets." Most units want to train staff quickly in the job functions, not in tool usage, for immediate productivity in the job. Long-service staff therefore become frustrated as they see new hires progress quickly to higher-rated jobs.

Unless technology and training is provided to support staff on-the-job, their only recourse is to take appropriate courses part-time or even full-time. Financial assistance

from the Corporation is available. However, many staff are not comfortable going back to school or cannot afford to do so for family reasons. They feel frustrated because they see that educational certification is highly valued in the Hydro culture, and formal learning seems to attract more recognition than does the on-the-job acquisition of similar skills. This creates a problem for staff who may acquire knowledge and skills similar to what is obtained via a degree program, and yet feel it is not equally visible and valued.

4.1.5 Availability of Internal Training

Some use has been made of internal or external courses, particularly those provided by Information Services Division (ISD) or the RD Personnel Office. ISD courses are felt to be helpful, but not good enough in terms of providing assistance with actual applications. Courses available from the RD Personnel Office are highly spoken of, particularly since they are locally available and self-paced.

Some professionals providing ad hoc support to clerical and secretarial staff say that they should be requesting more courses. However, these staff point to their lack of awareness as to what courses are available and, of those available, most suited to their training needs. They are also concerned about Hydro spending money on expensive courses that may not be very useful.

Some support staff feel that night courses are more convenient since they are attended on personal time and therefore do not interfere with the daily workload. They like the structuring of instruction in that information comes in small doses, and there is time to do exercises that allow them to apply what they have learned. Other staff, however, are very reluctant to use personal time for instruction, believing that paid time-off should be provided. It appears that usage of both formal and informal training depends greatly on the person's own initiative and willingness to use personal time. Supervisors note that this proactive attitude is important, recognized and rewarded with more interesting and challenging work.

Availability and quality of internal training are of particular concern when much of the technology is acquired in its embryonic stage. Often, research is done as much on such tools as by using them. Courses may not be available or poor in quality; most often, only manuals are available which are usually designed for reference purposes not for training. Some supervisors agree that there is a conflict between having the best, "leading edge" technology and being able to provide sufficient training and support. Others however feel that providing the newest and best "user-friendly" technology eases its introduction and initial negative impacts because staff are getting the best tools possible.

4.2 Support

4.2.1 Overview

Support for problems is available from a number of different sources, with varying degrees of usefulness. In general, it is felt that professionals are more knowledgeable than support staff as to where to get the required assistance because of the professional

peer-to-peer grapevine. Also, because of their "production-line" environment, support staff say they need the answers to problems immediately. They perceive that professionals are able to learn in anticipation of future work and thus don't have the same urgency to fix a problem.

4.2.2 Support from professionals

Professional staff have provided and continue to provide technical assistance to support staff (and other professionals) on an ad hoc basis. In the early days as technology was introduced in the Division, everyone was learning and support was provided out of interest because it provided the professional with more learning experiences. However, as their own familiarity has increased together with their workload, many of them no longer have the time or the inclination to respond. Many of them feel "bugged" by requests for their assistance, whether requests came from support staff or from other professionals.

Most respond anyway, at least to local requests, because the section secretary in particular appears to have nowhere else to get help, and because of perceived benefits to helping someone in their own section. Some don't, believing that the Clerical Services Supervisor has responsibility for all aspects of training and support because of the reporting relationship. Workload pressures in particular have reduced the altruistic help professionals used to provide to staff outside their immediate section.

Reaction from support staff to the assistance provided by professionals is uniformly appreciative. However, a number of problems with such support are identified:

a) it is felt to be "hit and run"; professionals like to fix the problem as quickly as possible, without explanation, and leave. If the problem could occur again, support staff feel uncomfortable with this approach, since they then don't know how to avoid or fix it themselves in future. Sometimes, the professional is clearly impatient and reluctant or unable to take the time to help the person understand.

b) jargon is often used so that any explanations that are given are difficult to understand. Incorrect assumptions are sometimes made about the support person's knowledge and understanding of the technology, who often are embarrassed when they have to confess their ignorance.

c) it is perceived that (lower) status of the support function is sometimes an issue that influences the willingness and interest of the professional in providing assistance. Some professionals say that they are called on to assist support staff in other sections or even departments because the local professionals don't want to "waste" their time.

4.2.3 Support from Operations Research

The Computing Services Unit (CSU) in Operations Research Department bears some formal responsibility for providing support to the secretaries. However, they say

they can't be expected to support every variety of hardware and software used in the Division, noting that there has been an increase in DOS and hardware-related problems such as system configurations and printers. They believe that most locally-used software products - with the exception of common ones such as Wordstar 2000, WordPerfect, LOTUS 1-2-3 and DBASE - should be supported locally. CSU staff have difficulty supporting packages which they do not use themselves, nor do they think they should be expected to do so; even getting learning time is sometimes a problem.

Often, CSU staff say, their best learning opportunity occurs as they are trying to solve a particular problem. Unfortunately, support staff with a production deadline need an immediate fix by someone who knows exactly what the problem is. Some staff therefore speak quite disparagingly of problem-solving, which they see as being "exploratory", particularly when problems are fixed inadvertently and CSU staff don't know why.

However, many support staff feel that CSU's support is good and that they have good relationships with the staff responsible for assistance. For the most part, they have developed personal relationships with the support people and are physically located close to the CSU office/computer area on the second floor. However, the common opinion held by all the support staff interviewed, particularly those not close to the CSU area, is that they would be best supported by dedicated, local staff whose job is formally recognized as a support role.

Some professionals perceive that CSU doesn't seem very interested in providing support to staff not in Operations Research. They speculate that support to secretarial staff is seen as boring, and that the staff responsible prefer more "intellectual" work such as program development. CSU staff aren't seen to have experience in the functions and technology they are supporting, nor are they seen as understanding the secretarial way of learning or problem-solving. On the other hand, CSU staff are surprised that these perceptions exist, since they are often called in to support specific packages within the Division, and have received very appreciative feedback.

CSU staff acknowledge that they sometimes don't immediately respond to trouble calls they feel are trivial and can be easily solved, hoping that the caller will eventually fix the problem themselves. This happens particularly when they are busy. However, support staff say they need immediate resolution of the problem so they can get on with the job, and feel it is faster to get someone to fix it rather than to experiment or consult reference manuals.

4.2.4 Support From Others

Supervisors may not have the same hardware/software as used by their support staff. Because of this, support staff feel that they frequently underestimate the time required to perform a task. They also may not be able to provide training or problem-solving services for unfamiliar technology. For support staff, this inability of the supervisor in particular to train or assist them with problems is a new and frustrating experience.

Staff may initially use more knowledgeable peers (i.e. other support staff) to obtain assistance. However, they quickly become reluctant to "bug" them for the same reasons as they don't want to impose on the professionals. They understand the heavy workload others have, and that providing such support is not part of their job functions nor is it recognized by their supervisors.

The competence and productivity of ISD aren't too highly thought of by the professional staff interviewed. Most support staff had no contact with ISD personnel; those who did (for corporate database applications on the mainframe such as purchasing and staffing), were generally satisfied with the response to their problems but occasionally found it difficult to get answers quickly because of the geographical separation.

4.3 Career Paths

4.3.1 Overview

In general, careers are being affected directly by technology and indirectly by the opportunity afforded by technology (time savings) to perform new functions. However, supervisors caution that increased expectations are met only if there are job opportunities and if individuals exercise initiative. There is more opportunity for staff to get more technical jobs or rotations if they have technology skills and experience, acquired academically or on the job.

Supervisors feel that support staff are more marketable with technical skills. However, traditional advancement via seniority is still the norm. Until computer skills are identified as actual job requirements, many staff can rely on seniority to obtain higher-rated jobs even if they are lacking such desirable skills. In fact, it is interesting to note that a number of support staff do not believe that technology helps their careers. However they do feel there are other personal benefits from learning the technology: more interesting work, increased pride and self-confidence, etc. as described in section 2 of this report.

The local work environment and supervision are perceived to have a significant impact on career opportunities. Support staff in "technology-rich" units with supervisors who encourage them to make full use of their own and technological capabilities have a significant advantage, and are envied by others. These staff indicate that they are reluctant to move into positions that are not making use of technology at a level similar to what they are currently enjoying. On the other hand, staff in "technology-poor" units or with less development-oriented supervisors are often frustrated because computer skills and experience are becoming necessary to compete successfully for higher-rated jobs. They believe that their career opportunities are therefore more limited.

It is interesting to note that there has been some advantage for support staff to be in units that were originally slow to acquire technology. These staff often now get newer and better technology than the others, who continue to operate their original technology

because upgrades or replacements are not as forthcoming. Senior staff, who may have been the ones to get the technology earlier, perceive a loss in status as junior staff get the newer technology for the first time and can do more.

In general, most of the support staff believe that their career paths are better if their local work supervisors are responsible for their development, so that there is clear accountability and fewer conflicts in priorities. Line supervisors indicate that they would have more interest in doing so if section secretaries for example truly "belonged" to the unit. On the other hand, there are concerns that some line supervisors may not have the interest, time and/or skills to develop administrative staff. This issue was the subject of an earlier study in the Division (see reference #1) and may be addressed in the CRESAP productivity study.

A significant factor in willingness to take advantage of career opportunities is geographical location of the position. Support staff feel that most opportunities are only available outside Research Division and many of them are very reluctant to change to a downtown (or North York) work location. They feel frustrated therefore at the lack of mobility within the Division, particularly those staff already at the top of their career ladder.

4.3.2 Administrative Career Opportunities

Secretarial jobs, and to a lesser extent clerical jobs, appear to be evolving into administrative assistant or information management jobs. There is an increasing requirement for staff with skills in using technology for the layout, retrieval and display of electronic information, particularly using graphics. All aspects of information management are becoming technology-intensive. Managers and supervisors express a desire to develop staff by expanding their job scope and providing more interesting and challenging duties.

At this time, the secretary as administrative assistant seems to be more apparent elsewhere in Ontario Hydro than at the Research Division. This evolution depends to a large extent on the availability of the technology in the unit, the initiative and capability of the secretary, and the ability and willingness of the supervisor to make better use of the secretary's capabilities by delegating more. In such situations, the productivity and effectiveness of both people are increased. Some argue that the "enlightened" supervisors will do just that, promoting the concept of the secretary and supervisor as an administrative team.

The administrative assistant using technology is able to provide better information to the decision-maker, particularly when the person they are supporting doesn't have the time or the inclination to learn and use the technology. Some section heads say they want a secretary who provides support as a research assistant or database administrator, taking over data collection, input and display in functions that are more intellectually challenging. Expert system technology is seen to be an important facilitator. Even now, some secretaries are off-loading the manager's administrative assistant's job functions (e.g. budgetting) because of capabilities provided by technology. One manager feels that

the involvement of the secretary in administering budget and client contacts improves the profile and quality of these functions, especially in assisting busy professionals.

On the other hand, at least one manager does not believe that a secretary can move into a departmental administrative assistant position at Research, because the demands at that level are more technically oriented towards the business of the department. He believes section administrative assistants are more feasible, and should be expected to interface more with the departmental administrative assistant. Other staff, however, question the high rating of existing departmental administrative assistants and do not see how much different they are from even section secretaries. There are those who believe that secretaries can perform a large part of the administrative assistant's job.

Records management is expected to be a growing area of career opportunity because of increasing legal requirements imposed on the Corporation. Technology and skills in information management functions such as storage and retrieval are becoming particularly important, i.e. electronic media management. At the same time, legal requirements for paper will be here for the forseeable future and must continue to be managed by staff performing traditional clerical functions.

4.3.3 Technical Career Opportunities

As more electronic networks are being implemented, support staff can take advantage of opportunities provided in network administration if they use their initiative to pursue them. There are also opportunities in investigating the potential for technology application to support activities, since the hiring freeze has restricted the availability of technical or professional analysts for this work. This can go as far as involvement in the actual implementation if the individual has some programming knowledge and skills. For example, some support staff at Research have done program conversion from one technology to another, and have provided software training and support to clients.

There are differences of opinion as to whether support staff can move into technician positions at the Research Division. Most believe that technology provides a bridge between them and that it has already "blurred" the lines by allowing both technical and administrative staff to perform technical and administrative functions. Others, however, say the move is difficult without relevant educational qualifications because of the technical complexity of technicians' jobs. Such qualifications may be difficult for support staff to obtain.

Other potential career opportunities are in the training function. Some support staff are consulted regularly as local experts on a particular technology when they have mastered the essentials themselves. If there is enough of a demand for such training and on-going support, it's an advantage if staff familiar with support functions take on these jobs.

4.4 Organizational Structure and Job Ratings

4.4.1 Job Challenges

In theory, simply changing tools (e.g. from typewriter to microcomputer) should not change the job rating. In practice, ratings may eventually go up if the job scope and responsibilities are expanded to reflect developing staff capability and more challenging work. One supervisor notes that it is helpful when staff do not have the mindset that they perform only work that is identified in the job description, particularly since job challenges are only successful if performance of additional duties is a reality. Job evaluation staff say that job rating challenges occur usually some time after the technology has been introduced, and when the novelty of its use and any new job duties has worn off.

Motivating staff to learn and use technology is difficult, particularly if the expectation that the job rating will be higher to reflect this is not met. The results of the most recent rating of the secretarial jobs at Research Division have had a negative effect on staff morale. They are upset that their significant learning effort, new skills with the technology and new functions are not being recognized and valued via a rate increase.

Keeping some consistency in job ratings, particularly for the section secretaries, is proving to be a problem. Because technology usage varies from section to section, the section secretaries' jobs may also vary accordingly. For example, if one job could theoretically be upgraded because of new duties made possible by technology, other section secretaries would demand similar technology and duties to achieve upgrading. The practice until this time, therefore, has generally been to keep all these jobs under the same job description and rating to avoid such problems.

However, this is a difficult situation for supervisors who want to develop their support staff and expand their job scope to meet unit support requirements more effectively with technology. On the other hand, it is also perceived by support staff as a convenient excuse for continuing with the status quo, when supervisors cite possible job challenges as a deterrent. They also perceive that other support staff who have obtained job upgrades and interesting work projects are benefiting from the initiative and persistance of "good" supervisors.

Rating of jobs which are vertically expanded in scope, with both high- and low-valued functions is difficult. One section head notes that the rating of the Director's secretary seems to put a cap on other secretarial job ratings, which is lower than what is achievable on the technician scale.

4.4.2 Structural considerations

The rating and advertising process appears to favour upgrading positions as opposed to creating new ones, because the former allows the incumbent to be retained without competition. If job demands change significantly and a new position is created, staff constraints require that the old support position is likely to be eliminated. The incumbent, particularly if junior, may not be the successful new job applicant. Even in

this scenario, staff felt that managers would prefer to hire more professional staff rather than support staff, if a regular position could be created.

As noted elsewhere, time savings generated by use of technology can be put to different uses, some of which are developmental for support staff. However, an alternative way of making use of the secretary's freed up time, is to have them provide the same services to more people e.g. managers or section heads can share one secretary. This reduces career opportunities when it occurs at higher levels because the number of secretarial positions required is thereby reduced. It also restricts the development of other skills and limits the ability of the secretary to take on other work from the manager/supervisor. Some managers may resist this alternative, seeing the loss of a dedicated secretary as a reduction in their own status. However, this alternative is currently being used in some units outside the Research Division.

Yet another alternative is being introduced outside the Division, which both secretaries and clerks view with concern. This involves combining both positions into one, usually held by the secretary. This is convenient when technology has freed-up the secretary's time and when the clerk position does not require full-time staff, particularly as professionals use technology to perform may of the clerical support functions. However, secretaries see this as a "step backward" in doing lower-rated clerical functions to fill-in their time. Clerks are concerned about their job security as the clerical positions are eliminated.

In general, technology facilitates the sharing of support by professionals. It is a management decision as to whether this is in the unit's and/or the staffs' overall best interests. At IBM, for example, staff formerly in the secretarial function have been retrained for more technical support staff positions.

4.5 Professionals' Usage

Technology to some extent has "blurred" the functional lines between support staff and professionals in that it provides to everyone the capability to perform what were traditionally support staff functions. Even services formerly provided by other professional staff can be taken over. For example, software packages are used by some staff to do their own drafting, which would previously have been done by the Drafting Section in Divisional Services.

There is no doubt that many labour-intensive functions formerly performed for professionals can now be done quicker by the professionals themselves using technology e.g. electronic "cut and paste" of information rather than rekeying. Even if not done quicker, the professional may choose to do it themselves because of the control they gain over format and turnaround time. This is expected to continue in most information management functions. Supervisors of such staff already have concerns about whether this is productive use of the professionals' time.

Many professional staff find use of the technology in itself interesting and challenging. Informally, they may be doing less engineering and scientific work, and

more technology support, administration and even programming. It is difficult to determine the extent of this, since it may not be obvious on casual inspection. Even when the novelty has worn off, professional staff may be reluctant to hand-off work to support staff, since this is a visible acknowledgement that they were even doing such work.

Management guidelines are therefore becoming necessary. There is a need to ensure that staff are not inappropriately doing some functions simply because the technology is at hand to do so and/or because they simply enjoy it. There are other concerns regarding the quality of the results. Professionals are usually not familiar with traditional secretarial functions, for example, and often violate corporate requirements for document formats, records retention, etc. This in turn makes the job of staff responsible for trying to retrieve such information more difficult, since official copies may not even have been produced and/or appropriately classified and filed. All of these issues can have a negative impact on the image of the Division and the morale of the support staff.

5. MANAGEMENT GUIDELINES

5.1 Overview

To this point, this report has documented the impacts of computer technology on the secretarial and clerical functions and identified key issues to raise the awareness level. This section presents for consideration some guidelines in managing current and future technological changes in the Research Division environment. While addressed to support staff functions, it should be noted again that many of these guidelines can be applied to any staff using computer or even other technology. For example, professionals may need just as much training and support as do the secretarial and clerical staff.

While these guidelines have been developed with reference to Research Division staff, other units in the Corporation share concerns about the impact of computer technology. In response to Production Branch, a corporate study in Ontario Hydro was carried out in 1988, with a mandate to "identify, evaluate and recommend approaches to successfully manage the working relations impacts associated with the introduction of computer technology in Ontario Hydro." (see reference #2). The report offers some useful guidelines, but concluded that the issue was not corporate in nature to-date and the working relations impacts were not major. Suggestions relevant to our own environment have been incorporated into this section.

5.2 Hiring

In general, new hires need to have significantly more technical knowledge and educational qualifications than they had in the past. Fortunately, the educational systems are cognizant of corporate needs with regard to computer skills and knowledge. Students are usually educated and trained in a variety of computer tools and support functions. While keyboarding and computer skills are important, perhaps even more important are

learning skills, flexibility and initiative. A positive attitude towards change is also desirable because of the nature of the Research Division's business and the variety of technology already in place.

It should be recognized that hiring such computer-literate, self-starting individuals into low-level unchallenging positions is a disservice to both them and the Division. They expect and need opportunities to use their initiative and skills, particularly since some skills atrophy quickly without application. Frustration sets in unless they can progress quickly into jobs which are a good match. One section head suggests that we may be hiring too many staff for their capability to advance, when there are not enough opportunities to do so.

It is becoming important to understand how to maintain job challenge, particularly as technology may replace previously enjoyed activities with repetitive, unchallenging ones. We should to the extent possible even eliminate unchallenging positions. We certainly need to evaluate potential incumbents to a job, particularly new hires, as to their capabilities and interest in using technology - it is expected that technology will continue to spread rapidly throughout Hydro (as budgets permit) to improve productivity. We should hire for traits indicating effectiveness of the person, rather than efficiency, and place them in challenging positions which allow as much use as possible of their capabilities.

It is suggested that the requirement for some of the low-rated support functions should be examined carefully. If they are indeed indispensible, they might readily be met with staff not having the above capabilities. Perhaps support jobs should be defined so as to segregate labour-intensive undemanding functions from technology-assisted functions. Hiring practices should then match individuals to job with regard to their ability and desire to deal with technological change and the likelihood of such change. In our Division, we should be very conscious of this and careful about hiring staff who would have difficulties dealing with change since change is fundamental in a research and development setting.

5.3 Introduction of technology

The manner of technology implementation is critical. If support staff functions are being affected, staff should be involved in the preliminary identification of need, and selection of appropriate technology. The time required for acclimatization should be recognized. The advantages not just to the individual in the performance of their job, but to the Division as a whole should be emphasized particularly in the use of new "leading-edge" technologies which often have off-setting implementation problems.

Some individuals will feel threatened by the new technology, uncertain of their own ability to learn quickly and of the security of their own job if their productivity is increased without a planned increase in workload. Management's commitment to employment continuity where jobs are going to be affected should be emphasized.

We should pay particular attention to the use made by professional staff of such technology, as a possible source of friction. Using computer software such as word processing or CAD instead of a pencil may well increase their productivity, but may be perceived by support staff or even other professionals as doing "their" work and thus threatening their job security. This can therefore lead to job challenges unless the circumstances are explained to staff's satisfaction.

5.4 Training/Education

There should be a commitment up-front that training, support and time on the job will be provided for staff to learn and become comfortable with the new technology. We need to understand how the person will react and support them accordingly. Individual needs and degree of initiative for skills development vary significantly. Expectations should be clearly identified to staff, and there should be a supportive work environment in which staff will be comfortable in identifying problems or training deficiencies which reduce productivity.

We need to identify when formal training or retraining is required, and when it is more appropriate to do on-the-job training. In both cases, it would be useful to designate another knowledgeable staff member, preferably close by, to provide initial support on the job. When introducing new technology, training should be appropriately timed. Preparatory training is best taken immediately prior to the introduction ("just in time" training). Otherwise, training should be provided as soon as possible afterwards. Skills development requirements should be re-examined periodically to provide further training as required.

We should encourage off-hours use of the technology. If possible and the person is willing, a portable computer for home use and learning should be made available. However, we should also be aware of limitations experienced by women in particular with regard to availability outside normal working hours, because of family demands. Corporate policies on providing extramural assistance, sabbatical leaves, alternate working hours arrangements, etc. should be utilized as appropriate. Since education is becoming increasingly important, staff should be encouraged and supported to upgrade their knowledge and skills. One section head suggests that Ontario Hydro should realize that human resources are limited, and that we should subsidize staff even in full-time attendance to achieve relevant educational qualifications.

There is a definite lack of basic knowledge of computer hardware and software concepts, particularly as regards DOS. The training services provided by the Personnel training office and CSU should be integrated. It is suggested that a training plan is required which instills the basics, allows for immediate application in an incremental rather than work-deadline-driven manner, and is conducted by local, dedicated staff who are familiar with secretarial and clerical job functions. One supervisor suggested that capable and interested support staff could rotate into and out of training and support positions, to keep the level of functional knowledge up-to-date.

Time is required not only of the support staff being trained, but also of their supervisors. They need to arrange for competent relief for support staff as they are being trained. Support work should get done in their absence, rather than be left to pile up. Information Services Division apparently offers the support services of highly trained and technologically-adept staff in this regard. A contractual arrangement for the Division may be an option worth pursuing.

The use of standard technology or transparent conversion capabilities in support functions would assist a great deal in reducing the breadth of training and re-training services required and the relief problem. Multi-functional or cross-training such that staff in specialized support jobs are able to relieve for each other would also be helpful. To some extent, standardization of computing facilities may also be encouraged to maintain productivity of all staff, not just secretarial and clerical staff. The investment in training in a variety of technologies can be significant. Processes to convert electronic information from one system to another are often complex, time consuming, and uninteresting to staff as well as often being less productive than simply re-entering the information.

5.5 Support

Local dedicated staff whose job it is to provide problem-solving assistance are recommended. This may or may not be the whole job, depending on the scope of the technology and numbers of staff to be supported. Familiarity with local applications is essential, as is the ability to identify and/or assist with the appropriate application of technology to other support functions. The use of the term "local" is as distinct from the "central" nature of a unit such as CSU. However, for common support functions such as word processing, common applications technology (e.g WordPerfect) should be supported and/or developed by central staff. A local support "hotline" similar to the 6400 number offered by ISD might also be quite useful, so that assistance is available from someone in the Division at all times.

To some extent, the secretarial and clerical staff themselves should keep up with developments in relevant technologies and be able to identify application opportunities for themselves. One obvious vehicle is to be on the circulation list, as most professionals are, for the appropriate magazines and newsletters.

5.6 Productivity

We should be aware of the consequences of work requests. For example, a secretary may now be able to produce 20 drafts of a document in the same time as it used to take to produce five. However, we should ask whether the result is "worth" this amount of effort, whether the secretary's job satisfaction has deteriorated, and whether another important task was left undone. We need to use common sense and good judgement; just because the technology is available and fast doesn't mean it should always be used.

Particularly in the beginning, we should check on how much effort is required to perform the function using the technology. With practice, the person will get better;

however, we want to make sure that using the technology is efficient and effective. Technology cannot be applied productively to all functions, and we need to understand what is appropriate and have common expectations as to how much effort and time is expected to meet the requirements. (For example, I have seen a secretary spend 15 minutes trying to produce a "perfectly" aligned one page memo on letterhead paper.)

However, we should encourage staff who are interested in applying the technology in new and different ways to their functions to improve their productivity. This may well take the form of providing additional training or relevant work assignments. Again, common sense and good judgement are required to ensure that the effort is appropriate in view of the likely results.

We should be aware of changes in communication patterns as technology facilitates interaction other than phone or face-to-face, particularly as used by supervisors of support staff. For example, we should ensure that the secretary is aware of pertinent information flows arising from the supervisor's independent use of technology. We may even need to create opportunities for social interaction on or off the job to compensate for such changes. We should not try to eliminate electronic "chit-chat" and bulletin boards which might include a number of non-work related topics; a reasonable level serves to build good working relationships and if forbidden, will simply go underground.

5.7 Job Satisfaction

We should understand which uses of the technology are tedious to staff and which are enjoyable, and adjust the workload accordingly if possible. Within reason, it is best to leave "how" a job is accomplished to the person since they will be aware of choices that we might not be. For example, the support staff may spend less time re-keying rather than editing electronic information that requires a significant number of changes, and prefer to do so.

Job design has a major impact on determining how motivating and productive an individual job is. In Mary L. Baetz's book, Planning for the Electronic Office (see reference #3), there is an excellent discussion of the various factors which can be used to assess job design: skill variety, task identity, task significance, autonomy and the amount of performance feedback provided by the job itself. The description of the impact of computing techology on job design and on social needs reflects some of the Research Division experience reported here.

Finally, we should ensure that staff using the technology are aware of physical strains, and take appropriate action, eg. adjusting chairs to proper height, adjusting monitor intensity, etc. There is a Hydro-produced handbook that is excellent (see reference #4). Regarding radiation concerns, Ontario Hydro has a policy that allows for temporary redeployment of staff to non-VDU-dependent functions during pregnancy if it can be conveniently arranged. While there is no evidence that any radiation hazard in fact exists, Hydro's policy deals with handling possible mental and physical stresses.

5.8 Career Development

Support staff appreciate and respond to recognition of their learning efforts and requirements for training time. They need opportunities to practice their skills with the technology. Most staff welcome interesting and challenging assignments made possible by the impact of technology on their jobs.

There is an onus on supervisors to articulate their support needs, the role of technology and the capability and interest of their support staff in meeting those needs. In many ways, this is a challenge: the time to do this analysis is in short supply; the value of the support position may be difficult to define; the expectations of the individual may or may not match their capabilities and/or the opportunities available.

We should be aware of the demands of family life, particularly on women, as they might conflict with unexpected time or travel requirements arising out of the clerk or secretary performing the new "professional" or analytical functions. There should be realistic expectations as to how well non-clerical/secretarial assignments can be performed initially. Training and work opportunities should be provided as appropriate to develop the person in these new areas.

Supervisors of support staff themselves need assistance and instruction in how to manage such staff, to delegate more,and to develop their potential. The corporate training function may be developing "team" training as it relates to the administrative secretary and their supervisor; if this is done, Research Division may be a good area to test the material. It is suggested that supervisors' performance be assessed with regard to support staff just as they are with regard to their professional staff.

5.9 Organizational structure and job ratings

Some managers suggest that the manager's secretary and administrative assistant positions be combined. This would provide an upgrade opportunity for the secretary and migration to M&P jobs, as well as job enrichment with a broader functional scope. The lower-rated duties of the position would be covered by a clerical position. The Director's own office was seen as a good model, for sections as well as departments, in having a support structure consisting of an administrative secretary and a clerk.

This support structure can be loosely described as a "management support team", consisting of the supervisor, an administrative secretary and a clerk. The secretarial job is redefined to include only higher-rated information management functions, with other functions either substituted with technology (e.g. voice messaging) or assigned as the clerical position's duties. Where demand for clerical assistance does not require full-time staff, sharing or student help during peak periods are viable options.

The Manager of the Staffing Department in Human Resources Branch believes that the "team concept" is an excellent one to pursue, with staff working together to develop and implement recommendations consistent with specified goals and objectives. He thinks that clerical staff are particularly underutilized in this regard.

The functions of secretarial staff in sections are becoming increasingly dependent on the technologies used in the section, which vary across the Division. Another study in the Division (see reference #1) has already addressed the reporting relationship issue. This study's findings seem to support the premise of benefits arising from the section secretaries and clerks reporting to the line organization, in terms of managing the impact of technology. It is also consistent with directions emerging from the CRESAP productivity studies in other parts of the Corporation, which appear to be promoting decentralization of such services to line management and the "management team" concept.

We need to anticipate how changes to jobs may affect job ratings. Keyboarding skills and use of simple menu-driven processes may not necessarily increase the value of the job. However, other changes are likely to occur which would do so even if higher-valued functions are not added to the job. Use of the technology may demand more independance of action in making choices affecting product quality or format, for example. It may require self-reliance in resolving system problems, ensuring reliability and security of the data stored in electronic format, etc..

5.10 Professionals' usage

The ratio between the number of support staff and professionals should be reviewed carefully, to discourage professionals from doing support work because of lack of such resources. We should anticipate and encourage the potential for delegation of technology-assisted functions from these staff to the secretarial and clerical support staff. This requires that such staff first be provided with the appropriate technology and training. The net effect is increased productivity and better use of all staff resources.

Guidelines should be defined and widely broadcast such that document format and records retention requirements are adhered to where it is important to do so. The provision of new or expanded support services, such as editorial review and records management, would create career opportunities for support staff and allow the Division to meet its legal obligations while maintaining appropriate quality standards.

6. CONCLUSION

6.1 Applicability of findings

Section to section in Research Division, there are differences in the rate of introduction and application of appropriate technologies, and in their usage by support staff. Some section heads have had more time and resources than others to analyze local support needs and to develop their staff to meet those needs. In some areas, therefore, secretaries and clerks are more advanced along the career paths described in this report than in others. Personal initiative, availability of technological resources and work opportunities are key factors when evaluating the overall impact of computer technology. Much of what has been documented here as impacts on the support staff applies very easily to others using computer technology.

It is commonly true, however, that the poorer the technological support available to support staff, the more likely it is that professionals with better technology perform support functions themselves to achieve better quality and responsiveness. Unfortunately, service functions tend to be undervalued and lower profile and therefore under-resourced, particularly when it comes to expensive computing technology. However, professionals see a direct benefit to their own productivity in having a more capable support staff. As the cost of technology continues to fall, it should become more widely available to all staff.

6.2 Future direction

Managing issues such as training, support, job ratings, organizational structure and professionals' usage of computer technology has already proved to be quite challenging. Some supervisors predict that most of the traditional support jobs will eventually be replaced by more technical jobs, and in reduced numbers because of the increased support capability provided directly to professional staff by technology. An interesting article is attached as Appendix 4, which includes descriptions of what might be a typical day in the life of an office employee and of a manager in a technology-enhanced environment.

The introduction of new and different technologies, particularly as I.C.E. is implemented, will continue to have an impact on the functions of all staff. We will do work differently, we will do different work, and the support requirements will change accordingly. It is hoped that this report will foster a greater awareness and understanding of the impact of what has gone on before to improve future management decisions regarding the key issues.

Approved:

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REFERENCES

1. Buchan, P.G., Research Division Affirmative Action Committee. "Evaluation of an Alternative Reporting System for Section Clerk-Stenographers", March 1988, Research Division report #88-43-H.

2. Corporate Working Group, Human Resources Branch. "Working Relations Impacts of Computer Technology - Guidelines", June 1988.

3. Baetz, Mary L. *Planning for People in the Electronic Office*, Holt, Rinehart and Winston of Canada, Limited, 1985, pp 105-118.

4. Mallette, R., Staff Resources and Development Division. *A Practical Guide to Users of Office Automated Equipment*, 1985.

APPENDIX 1

Interviewees Outside Research Division

Carole Ann Alloway	Business & Information System Analyst, Supply Division
Barry Behrend	Manager, Information Technology Services, Information Services Division
Mary Cofield	Assistant Management Staff Relations Officer, Staff Relations Division
Ruth Esdon	Administrative Services Officer, Information Services Division
Lorraine Irvine	Job Evaluation Analyst, Compensation and Benefits Division
Danny Quan	Corporate Official Records Coordinator, Office of the Secretary
Shirley Rudderham	Manager, Operations Administrative Services, Central Production Services Division
Rita Sacco	Secretary, Corporate Training & Development, Human Resource Services Division
Ray Sitton	Manager, Staffing Department, Human Resource Services Division
Linda Taiabjee	Manager, Administration and Services, System Planning Division
Carol Watson	Management Employee Relations Officer, Staff Relations Division
Marilyn Weir	Information/Office Systems Officer, Human Resources Strategy & Policy Department, Human Resources Branch
Etta Wharton	Manager, Employment Equity Department, Human Resources Branch

Bank of Nova Scotia vice-presidents: Mary Anne Chambers, Al Giles, Henry Regnitter

APPENDIX 2

Research Division Interviewees - Managers, Supervisors and Others

Mikk Anyas-Weiss	Manager, Divisional Projects
Anton Baljet	Manager, Electrical Research
Roger Beaulieu	Unit Head, Electrical Research
Michael Booth	Section Head, Chemical Research
Bruce Brown	Manager, Divisional Services
Jim Brown	Manager, Metallurgical Research
Archie Chung	Manager, Operations Research
Gord Clarke	Manager, Mechanical Research
Dave Craig	Section Head, Mechanical Research
Jerry Craig	Section Head, Divisional Services
Dave Dodd	Manager, Chemical Research
Bob Dowdell	former O.H.E.U. Chief Steward, Research
Primo Favaro	Technologist, Mechanical Research
Ron Fleck	Section Head, Metallurgical Research
Gary Ford	Section Head, Electrical Research
Martin Green	Engineer/Physicist, Electrical Research
Larry Gouge	Divisional Personnel Manager
Tony Klym	Manager, Civil Research
Bill Locke	Personnel Officer
Rick Madge	Engineer, Electrical Research
Dave McGhee	Computer Support Technician, Operations Research
Don Mills	Director
Celina Moraes	Clerical Services Supervisor, Divisional Services
Jim Spiers	Unit Head, Divisional Services
Helen Thomson	Administrative Assistant, Divisional Services
Ted Vangel	Computer Support Supervisor, Operations Research

APPENDIX 3

Research Division Interviewees - Secretaries, Clerks

Sally Barr	Personnel Clerk
Helen Buchkowsky	Section Secretary, Chemical Research
Sherry Burnside	Clerk-Cashier, Divisional Services
Rose Colatosti	Departmental Secretary, Mechanical Research
Leslie Compton	Section Secretary, Metallurgical Research
Resi Dal Mina	Support Services Clerk, Electrical Research
Sue Flynn	Section Secretary, Mechanical Research
Monica Gallagher	Administrative Secretary to the Director
Heather Hunter	Senior Accounting Clerk, Divisional Services
Jenny Janes	Senior Requisition & Records Clerk, Divisional Services
Wendy Labaj	Departmental Secretary, Civil Research
Ivy Lo	Technical Clerk, Chemical Research
Marlene McPherson	Departmental Secretary, Electrical Research
Grace Pereira	Departmental Secretary, Divisonal Projects/Operations Research
Lynne Robichaud	Departmental Secretary, Metallurgical Research
Rita Vollick	Departmental Secretary, Chemical Research

APPENDIX 4

Office automation's impact on personnel

Involving staff in the choice of equipment is an important key

Zane Quible and Jane N. Hammer

Office automation is frequently associated with rapidly changing equipment. While the term "automation" implies using equipment rather than people, a decline in the number of personnel is not now apparent. As office equipment changes, people's jobs are also changing—but jobs are still there.

People have traditionally resisted change. With the advent of robots in factories in the Orient, factory workers in the U.S. expressed concern about the stability of their jobs. As automation—or at least the term—entered the office, people began to fear being replaced just as they feared the electric typewriter when it entered the office scene.

The introduction of any type of change creates problems for those associated with that change. The people who use the new equipment have problems and thus create problems for supervisors who must also adjust to change. Human resource management takes on a new perspective as managers adjust to employees trying to cope with their own fears. These changes create challenges for human resource managers of any organization contemplating the implementation of automation.

Office personnel

The impact of automation of office personnel will be significant. The equipment which these employees use in their jobs will enable them to perform their duties with more sophistication, greater ease and higher efficiency.

The traditional typewriter will disappear from the desks of many office personnel. The functions for which the typewriter has been used for several decades will be performed on more sophisticated equipment. Although these new desk-top devices vary considerably in their capabilities, those used in automated office systems have two fundamental characteristics: They are electronically linked to other devices; and they facilitate electronic storage of material.

Linking devices electronically increases the overall sophistication and efficiency of automated office systems. The linking of devices is accomplished through electronic networks. In most instances, devices linked to another are more functional; thus linking increases the efficiency with which employees are able to perform their jobs.

Storing material electronically makes it available for later use, which is also advantageous from an efficiency standpoint. When an author wishes to make changes in the first draft of a document, only the changes have to be entered since the material has been stored electronically from the time that it was first entered. If a letter is to be sent to a number of individuals, the letter only has to be typed one time. The names and addresses of the recipients are merged with the letter, and the equipment automatically prepares an original for each recipient.

Word processing is a common function of office personnel in organizations that have installed automated office systems. The equipment these

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employees use for word processing is quite diverse. Some of the equipment is capable of performing only word processing functions. Other devices are capable of performing as word processors and as terminals for performing data processing functions. Personal computers loaded with the appropriate software can also be used for word processing.

Attaching the devices used to perform word processing functions to a network increases their functionality. Interconnected devices can send documents to each other (in electronic format), as well as communicate with a computer. The devices can be used for maintaining one's electronic calendar as well and for sending electronic messages and mail to other individuals inside and outside the organization. The number of ways in which office personnel will use the equipment in automated office systems will continue to expand as new equipment is developed.

A day in the life of an office employee. The following describes a typical day in the life of Pat, a fairly high-level office employee who works for an organization that has implemented an automated office system.

Upon arriving at the office each morning, Pat accesses the electronic message file to see if any messages have been received during the night. This task is easily accomplished by using the terminal keyboard to enter the appropriate accessing codes into the system. Almost instantly, the messages appear on the terminal screen. (When desired, messages also can be permanently filed in electronic storage.)

Pat notices a message from one of the managers. This manager, who is presently out of town, asked Pat to schedule a meeting of a committee. The meeting is not to last more than two hours, and is to be scheduled either next Wednesday or Thursday. Pat asks the computer to provide a list of two-hour blocks of time on these two days during which all committee members are available. Four different blocks appear on the list, and Pat selects the 10:00 to 12:00 block of time on Wednesday. Pat then directs the computer to place this meeting on each of the members' electronic calendars and also asks that they be notified (by electronic message) of the meeting as soon as possible.

Shortly thereafter, Pat uses the terminal keyboard to view a screen display of the day's activity schedule. Pat examines the schedule to determine which activities have to be completed by day's end. Pat, like most individuals, prefers to put a reminder notice in the schedule a few days before a major project is due.

Pat also has some word processing responsibilities. The more sophisticated word processing installations found in automated office systems enable word originators (executives) to record their dictation 24 hours a day. Pat notices that some dictation to be "keyboarded" was stored during the night. The originator has asked that the first draft be returned so that editing can be performed. The edited copy will be returned to Pat, who keyboards the changes, and another draft is prepared for the originator to review. When authorized for release, a final draft of the letter is prepared.

Involving employees in designing and installing the system will help allay their fears and anxieties.

The originator specifies that the final draft of the letter should be transmitted electronically to the recipient. Accordingly, Pat performs the steps necessary to facilitate the transmission through a network. The recipient receives the letter on a terminal screen. After reading the letter, the recipient uses the terminal to file the letter in electronic storage. (The letter could also have been sent by mail or by facsimile process.)

Originators, including some for whom Pat works, are using their desk-top devices to compose their work. In some instances, office employees check their work and make any corrections needed in spelling, punctuation and grammar. Other originators have office employees keyboard the original draft from dictation or handwritten material. Once the material is keyboarded, the originators use the terminals on their desk tops to keyboard changes in the material resulting from the editing process. Some originators, especially those who have excellent mechanical composition skills, are finding that it is easier for them to compose a document on a keyboard than it is to dictate or handwrite the material. Pat typically spends part of each day refining material keyboarded by the originators.

Pat, who also has responsibilities for maintaining the department's budget, uses the terminal to update figures and to request copies of the new

budget. In addition, Pat often uses the terminal to prepare graphics for reports prepared by the originators.

One of the managers for whom Pat works is preparing a speech for delivery to a national management association convention. The manager has asked Pat to access several videotext subscriber services to determine if any information is contained in these electronic files that might be helpful in writing the speech. A hard copy of the desired information can be easily obtained. The manager also asks Pat to make his airline and hotel reservations for the convention. Pat uses her desk-top terminal to make the desired reservations.

Because Pat had to leave work early for a doctor's appointment, all work was not completed. Pat also knows that tomorrow is going to be a hectic day, especially since today's backlog has to be carried over. Since Pat has a personal computer at home that is compatible with the organization's system, the backlog is completed at home and subsequently transmitted to the organization over standard telephone lines. A modem is used in the transmission process.

Managers will be affected just as much as office personnel by office automation—and in some cases, even more so.

Problems encountered by office personnel. The installation of an automated office system is not universally accepted by all office personnel in all organizations. In some organizations, the installation of a system is met with considerable resistance. An awareness of the reasons that office personnel resist the installation of an automated office system is quite helpful in dealing with their lack of acceptance.

Office employees are likely to resist the installation of office automation for two basic reasons: (1) they fear being replaced by the new sophisticated, more efficient equipment; and (2) they experience anxiety when confronted with having to learn to use new sophisticated, technical equipment.

Involving employees in designing and installing the system will help allay their fears and anxieties. The following types of involvement are possible: Participating in the process of planning for the new system, having early hands-on experience using the equipment and receiving extensive information about the reasons for installing such a system, its benefits, how the system works and how it will affect them.

It is also important to assure office employees that the installation of an automated office system will not cause them to be terminated. Rather, it will enable those whose jobs become more automated to work more productively and efficiently. The attrition rate of office personnel in most organizations is sufficient to accommodate any temporary employee surpluses.

To a large extent, office employees' acceptance of automated systems is affected by the amount of orientation, indoctrination and training they receive. The more familiar employees are with a system, the more they will support its use. Employees who are poorly trained will find the equipment difficult to use, which will affect their attitudes and their productivity.

Managers

Managers will be affected just as much as office personnel by office automation—and in some cases, even more so. The way they carry out various job duties will change drastically, primarily because of the availability of new equipment. Managers will be making greater use of the executive work station, an electronic device placed on their desk top.

The electronic equipment which executives will use is similar in many ways to the equipment that office personnel will use. It will be more sophisticated in order to handle a few different functions, especially in areas such as database management and interoffice communications.

Executive work stations support a variety of different functions, including word processing, data processing, electronic messaging, electronic mail, graphics preparation, scheduling and calendaring. The functional capability of the equipment is continually increasing as new technology is developed.

The two characteristics of the equipment used by office personnel will also be found in the equipment used by managers. These characteristics include the electronic storage capability and the electronic linkage of devices.

A day in the life of a manager. An effective way to illustrate how office automation will affect managers is to describe a day in the life of a

manager. Although the various automated office systems will affect managers' jobs differently, the following description is fairly typical.

Before leaving home for work, Leslie uses a personal home computer to access an electronic message file at the office as well as the day's schedule. Leslie discovers a message from a superior. Leslie is asked to provide additional documentation to support a request for two new employee positions in the department. On the train to work, Leslie is able to keyboard a response on a briefcase-size computer. After Leslie arrives at work, the message is entered through a modem into the organization's system and subsequently sent as an electronic message to the superior.

Leslie looks at the day's schedule and notices that a committee meeting is to be held that afternoon. Several subjects need to be discussed under "new business" at the meeting. To help Leslie remember key points about these subjects, several thoughts are keyboarded and printed on the small printer attached to the briefcase-size computer.

Leslie is also reminded to prepare some background material for use by the members of a committee that meets next week. Upon arriving at the office, Leslie uses the desk-top terminal to compose this information and then asks the secretary to review the work for spelling, punctuation and grammatical accuracy. Leslie also asks the secretary to transmit the material to each member after the work is corrected. After making a few changes, the secretary depresses a few keys on the terminal's keyboard and the system electronically transmits the information to each recipient.

Leslie then dictates a memo that is to be sent to various individuals in several branch offices. After it has been keyboarded by the secretary and approved for release, the system automatically dials the telephone number of each recipient and the memo is sent in electronic format to each individual. Each recipient is asked to respond to a certain item in the memo. Several do so by electronic message. When Leslie returns from lunch, a light is blinking on the work station that indicates the receipt of messages since the last time the electronic message file was "emptied". These messages are received on the terminal screen.

Another blinking light on the work station indicates the receipt of electronic mail. Accessing the electronic mail file reveals the names of the individuals from whom letters have been received as well as the time each letter was received. To read the letters, Leslie simply depresses several keys on the keyboard and each letter is displayed—one by one—on the screen. The decision is made to keyboard an immediate reply to one individual. As soon as the reply is composed, Leslie directs the system to send it to the recipient. Since the recipient's phone number is already stored in the system, the letter can be transmitted without additional human effort.

Leslie remembers to call her insurance agent about home owner's insurance. The keyboard is used to access the name/address/phone number file. When the agent's number is located, Leslie depresses a button on the keyboard which directs the system to dial the phone number. The agent's line is busy, so the system continues to dial the number every 30 seconds or so until the call goes through. The speakerphone on Leslie's desk frees Leslie from having to hold the telephone handset during the time that the system automatically continues to redial the agent's number.

While management may be able to dictate the general type of equipment to be installed, employees can give vital information about and provide a fresh perspective on what will make their jobs easier.

The telephone not only allows Leslie freedom from dialing frequently called numbers and freedom to do other things during a phone conversation, but it also allows Leslie to determine whether or not talking with the phoned person is necessary. If Leslie determines that leaving a message for the agent is adequate, electronic voice messaging provides a store-and-forward capability that enables Leslie and the agent freedom from the phone while still allowing them to send and receive messages. No longer does the caller have to play "telephone tag" with the recipient. All Leslie needs to do is to leave a message which is recorded on the agent's telephone. When the agent returns to the office, a light signaling the presence of a message allows the agent to listen and respond to the message. Leslie can continue with the tasks for the day knowing that the situation has been handled.

Employees in the organization in which Leslie

works recently received their midyear bonuses. Leslie wants to invest about half of the bonus in the stock market. When a particular stock reaches a certain price, Leslie plans to buy. Leslie uses the terminal to access a stock market videotext subscriber service that will give the current stock prices. The organization subscribes to a number of other videotext services as well. Leslie is a frequent user of several of these when collecting data for use in research-oriented projects.

Before Leslie leaves the office at the end of the work day, the schedule is accessed to see what activities will be necessary during each of the next several days. Leslie notices the absence of any face-to-face appointments scheduled the day after tomorrow, and there are no other activities on the schedule that would require Leslie to be physically present in the office.

The organization allows employees, once they reach a certain managerial level, to "telecommute". Leslie calls the superior to get permission to telecommute the day after tomorrow. After getting the necessary permission, Leslie notifies the system that there are to be no face-to-face appointments that day.

Leslie is working on the year-end report and feels that the uninterrupted time which is available by working at home will be especially conducive to getting the report finished. Any electronically stored data or information which is needed to work on the report will be accessible through Leslie's home computer. Once Leslie has finished editing the report, the text can be sent over telephone lines to the organization. The 20 paper copies of the report which are needed can be printed and ready to distribute to the appropriate individuals when she arrives at work the next morning.

IMPACT ON PERSONNEL

Problems encountered by managers. Some of the problems encountered by managers are similar to the problems encountered by office personnel. Most common among these are the fears and anxieties experienced by managers when having to adjust to new ways of doing their work. Because older managers matured before the computer era, they are likely to experience more anxiety when

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an automated office system is installed than are younger managers.

Managers who help plan and design the system often find it a complex task. They have to make sure that the system is capable of doing what the employees want, is cost effective, and can be expanded and/or modified as the need arises. In some organizations, the planning and designing process is so complex that consultants have to be used.

Another problem experienced by managers is keeping up to date with new developments in automated office systems. Unless they keep abreast of these developments and implement those which are desirable and justifiable, the new system could become dated quite quickly.

Top management support of the installation of an automated office system is also crucial. In some instances, the lack of top management support is a stumbling block. Although top management may endorse the idea, it is not always willing to provide support at the level needed to get the system installed.

One of the more deep-rooted concerns of top management is likely to be the security of the organization's database. The electronic storage of most of the organization's information and data will create a huge database. Management's concern will focus on securing it and making it inaccessible to unauthorized individuals.

Suggestions for the trainer

Working with managers as well as with office personnel in adapting the office automation presents many challenges. One must consider age, previous exposure to electronic devices and status in the organization.

Age and previous exposure are often closely related. The younger people are, the greater is the chance of their having encountered electronic devices before. Rather than surprising employees by presenting them with an electronic device, they should be prepared psychologically to ensure their acceptance and use of equipment.

Understanding that people do fear electronic devices, identifying that fear and allaying it are crucial to the automation of the office. Employee participation in the equipment selection process is a key to acceptance. Explaining the need for the equipment and how that equipment will make their jobs easier is crucial to the acceptance of automation. People often feel that they are substandard when equipment is brought into the office environment.

Employees who have some input in the choice of equipment will be more likely to use that equipment than if the decision is made without consulting them. While management may be able to dictate the general type of equipment to be installed, employees can give vital information about and provide a fresh perspective on what will make their jobs easier. Identification of a need can be aided as well; the quality circle concept can work in the office as well as on the assembly line.

Status is one key to executive use of equipment. The status of an electronic work station is much greater than the status awarded to typewriters. Typwriters were—and still are—viewed as the tool of a subordinate. Consequently, many executives want nothing to do with them. Fortunately, the keyboard associated with the executive work station has no image problem to overcome. Approaching the equipment from the standpoint of ease of use as well as from the standpoint of increased productivity can help give the equipment—and consequently the user—increased status in the executive's eyes. One-to-one relationships in instructing individuals how to get the equipment to do the things necessary to make the executive's life easier are crucial.

Involvement and understanding are necessary for a trainer working with the implementation of office automation. Whether working with a manager or with office personnel, the human resource manager must consider the impact of automation on *people*. □

works recently received their midyear bonuses. Leslie wants to invest about half of the bonus in the stock market. When a particular stock reaches a certain price, Leslie plans to buy. Leslie uses the terminal to access a stock market videotext subscriber service that will give the current stock prices. The organization subscribes to a number of other videotext services as well. Leslie is a frequent user of several of these when collecting data for use in research-oriented projects.

Before Leslie leaves the office at the end of the work day, the schedule is accessed to see what activities will be necessary during each of the next several days. Leslie notices the absence of any face-to-face appointments scheduled the day after tomorrow, and there are no other activities on the schedule that would require Leslie to be physically present in the office.

The organization allows employees, once they reach a certain managerial level, to "telecommute". Leslie calls the superior to get permission to telecommute the day after tomorrow. After getting the necessary permission, Leslie notifies the system that there are to be no face-to-face appointments that day.

Leslie is working on the year-end report and feels that the uninterrupted time which is available by working at home will be especially conducive to getting the report finished. Any electronically stored data or information which is needed to work on the report will be accessible through Leslie's home computer. Once Leslie has finished editing the report, the text can be sent over telephone lines to the organization. The 20 paper copies of the report which are needed can be printed and ready to distribute to the appropriate individuals when she arrives at work the next morning.

IMPACT ON PERSONNEL

Problems encountered by managers. Some of the problems encountered by managers are similar to the problems encountered by office personnel. Most common among these are the fears and anxieties experienced by managers when having to adjust to new ways of doing their work. Because older managers matured before the computer era, they are likely to experience more anxiety when

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an automated office system is installed than are younger managers.

Managers who help plan and design the system often find it a complex task. They have to make sure that the system is capable of doing what the employees want, is cost effective, and can be expanded and/or modified as the need arises. In some organizations, the planning and designing process is so complex that consultants have to be used.

Another problem experienced by managers is keeping up to date with new developments in automated office systems. Unless they keep abreast of these developments and implement those which are desirable and justifiable, the new system could become dated quite quickly.

Top management support of the installation of an automated office system is also crucial. In some instances, the lack of top management support is a stumbling block. Although top management may endorse the idea, it is not always willing to provide support at the level needed to get the system installed.

One of the more deep-rooted concerns of top management is likely to be the security of the organization's database. The electronic storage of most of the organization's information and data will create a huge database. Management's concern will focus on securing it and making it inaccessible to unauthorized individuals.

Suggestions for the trainer

Working with managers as well as with office personnel in adapting the office automation presents many challenges. One must consider age, previous exposure to electronic devices and status in the organization.

Age and previous exposure are often closely related. The younger people are, the greater is the chance of their having encountered electronic devices before. Rather than surprising employees by presenting them with an electronic device, they should be prepared psychologically to ensure their acceptance and use of equipment.

Understanding that people do fear electronic devices, identifying that fear and allaying it are crucial to the automation of the office. Employee participation in the equipment selection process is a key to acceptance. Explaining the need for the equipment and how that equipment will make their jobs easier is crucial to the acceptance of automation. People often feel that they are substandard when equipment is brought into the office environment.

Employees who have some input in the choice of equipment will be more likely to use that equipment than if the decision is made without consulting them. While management may be able to dictate the general type of equipment to be installed, employees can give vital information about and provide a fresh perspective on what will make their jobs easier. Identification of a need can be aided as well; the quality circle concept can work in the office as well as on the assembly line.

Status is one key to executive use of equipment. The status of an electronic work station is much greater than the status awarded to typewriters. Typwriters were—and still are—viewed as the tool of a subordinate. Consequently, many executives want nothing to do with them. Fortunately, the keyboard associated with the executive work station has no image problem to overcome. Approaching the equipment from the standpoint of ease of use as well as from the standpoint of increased productivity can help give the equipment—and consequently the user—increased status in the executive's eyes. One-to-one relationships in instructing individuals how to get the equipment to do the things necessary to make the executive's life easier are crucial.

Involvement and understanding are necessary for a trainer working with the implementation of office automation. Whether working with a manager or with office personnel, the human resource manager must consider the impact of automation on *people*. □